Discussion on "The Fabrication of the First French Spoke Prototype" by Jean Lesrel

Details of the Orsay design were discussed. Lesrel clarified that the frequency variation from air to vacuum was quoted per atm and included vacuum loading and dielectric effects. The cavity stiffening is self-supporting and no extra support is needed to put the cavity under vacuum.
The spoke fabrication itself was discussed next. A spoke cylinder was welded from two pieces, then the flat part at the aperture was formed by squashing. The weld is positioned to go across the center of the beam hole. The reason is the location of the highest electric fields that are on the outside curvature of the spoke racetrack. Delayen commented that for an optimized spoke the electric field in the center plane should be constant around the circumference of the spoke. To add the spoke to the cavity, the cavity body is deformed to slip the spoke from inside into its proper position, then the connection is fully welded from the outside.
In a next topic the flanges of their spoke resonator were discussed. The cavity and all flanges are made from niobium and indium seals are used at the flanges. The reasoning behind that was elimination of more complex handling of the prototype. Lesrel and Junquera explained that the BCP by dumping the cavity into a bath might cause problems at the brazes of other flanges. Schrage argued that CERCA, the fabricator of that spoke cavity, delivered elliptical cavities to LANL that had brazes for stainless steel flanges and there were no problems seen in LANL's flow-through BCP. He suggested not to do BCP by dumping the cavity into a bath, as this reduces wall thickness twice as fast as regular BCP. Bousson replied that this scheme will only be used for the first BCP of the first prototype cavity, subsequent dumps will only be done from the inside, as the system to do that is not ready yet.
Shepard pointed out that designs using brazes need to pay attention to remelt problems, if subsequent welds need to be done close to a braze joint. They had to address this for the helium vessel fixtures on their 2-spoke resonator.
Asked about their future plans for flanges, Junquera explained that they intend to go to the TESLA flange design using an aluminum gasket. Schrage pointed out that this design seems to need more understanding and that the copper gasket used for all LANL cavities turned out to be a very robust seal.
As a last topic potential risks due to a ring attached to the stiffening ribs were discussed. It turned out that the ring was a design option that is not needed for future cavities. Also it does not present a danger of a trapped gas volume, as there is a gap between the ring and the resonator endwall. It was not clarified, if the ring was needed to hold the stiffening ribs in place for welding.